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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,675	03/16/2007	Igor Khrushchev	8655.001	2207

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EXAMINER	
LEUNG, QUYEN PHAN	
ART UNIT	**PAPER NUMBER**
2874	
MAIL DATE	**DELIVERY MODE**
12/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,675	KHRUSHCHEV ET AL.	
	Examiner	Art Unit	
	Quyen P. Leung	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-62 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3, 26-29, 51-53, 57-60, 62 is/are rejected.

7)☒ Claim(s) 4-25,30-50,54-56 and 61 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The references cited in the Search Report PCT/GB2004/004334 have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

Claim Objections

Claims 6-8, 13, 16, 19-21, 23, 25-26, 30-31, 33, 35, 39, 54-55, 62 are objected to because of the following informalities:

- Re claims 6, 20, 33, 39, 54, it is unclear what units ***lm*** represents (see claim 6 line 3; claim 20 line 2; claim 33 line 3; claim 39 lines 2-3 and claim 54 lines 2-3).
- Re claim 6 line 3; claim 7 line 2; claim 8, line 2; claim 13 line 2; claim 16 line 2; claim 16 line 3; claim 19 line 2; claim 20 line 2; claim 21 line 2; claim 23 line 2; claim 25 line 1; claim 26 line 2; claim 30 line 2; claim 31 line 2; claim 33 line 3; claim 39 line 2; claim 54 line 2, claim 55 line 3, claim 55 line 4; and claim 62 line 2: the recitation of ***preferably*** makes the claim unclear whether or not the limitation is required or optional.

- Re claim 33, the recitation of ***?m*** in line 2 is unclear as to what unit applicant is claiming.
- Re claim 35, ***dimensional/ has*** is recited in line 2. Did applicant mean instead ***dimensional and has***?
- Re claim 51 line 4 and line 8, ***focussed*** has been misspelled and should be ***focused***.
- Re claim 55 it lacks an ending **period**.

Appropriate correction is required.

Claims 4-25, 30-50, 54-56, 61 are objected to under 37 CFR 1.75(c) as being in improper form because a **multiple dependent claim cannot depend another multiple dependent claim**. For example, claim 4 depends on claim 1, 2, or 3, but claim 3 is already a multiple dependent claim dependent upon claims 1 or 2. See MPEP § 608.01(n). ***Accordingly, the claims 4-25, 30-50, 54-56, 61 have not been further treated on the merits.***

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 26-29, 51-53, 57-60, 62 are rejected under 35 U.S.C. 102(b) as being anticipated by Will et al (DE 101 55 492).

Re claims 1, 3, 57, see figures 1-6 for a method of altering the refractive index of a region of a crystal comprising **focusing** a pulsed laser beam at a desired position within the crystal and **moving** the focused beam along a path such that the focused beam alters the refractive index of the region of the crystal along the path.

It is inherent that the refractive index is altered because Will et al teaches a waveguide that is formed. A wave is guided when the surrounded by material of lower refractive index. Re the focusing optics, see figure 1 elements 2, 7. Re the pulsed laser beam, see figure 3 for the parameters of pulse energy and pulse duration. Re the crystal, see figure 1 element 4 for the optical transparent material and in claim 9 lines 5-6 of Will et al (reproduced below) suggesting crystal (Kristalle) as a material choice for element 4. Re moving the focused beam along a path, note figure 5 which shows the writing method and in particular note the xy-stepper and z-stepper which move the laser beam relative to the crystal (4).

Fig. 1: Setup for Direct Waveguide Writing

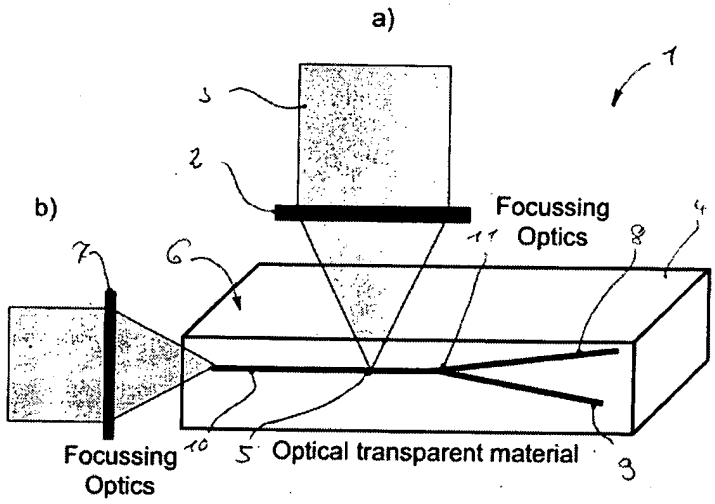


Fig. 3: Splitter Writing Method
(Example 1 X 2 Splitter)

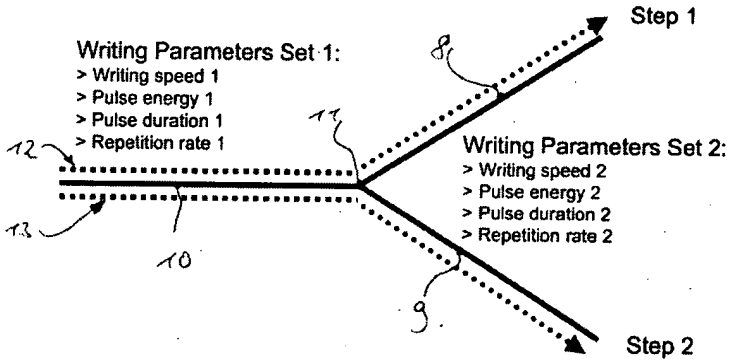
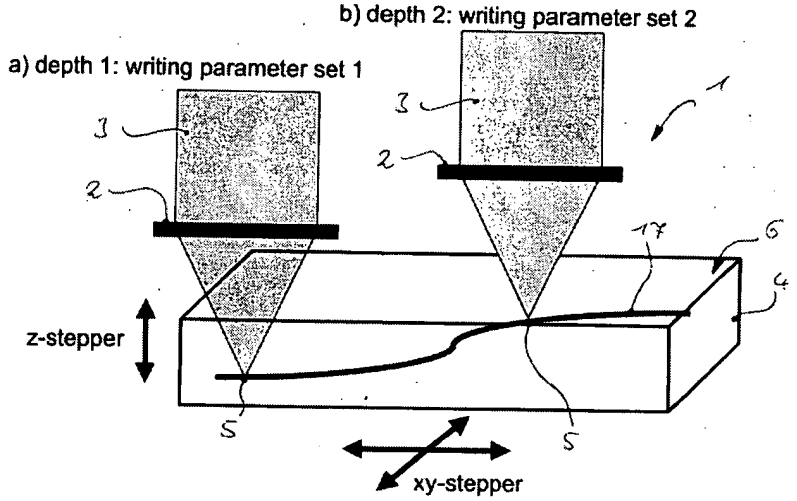


Fig. 5: 3D Writing Method



9. Verfahren zur Herstellung eines optischen Verzweigers, insbesondere eines Mehrfach-Strahlteilers, insbesondere nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das durch Licht änderbare Material (4) aus der Gruppe ausgewählt ist, die Gläser, Kristalle und Glaskeramiken umfasst, welche bei einer Schreibwellenlänge im Bereich von 300 nm bis 1700 nm, besonders bevorzugt bei einer Schreibwellenlänge von ca. 400 nm, ca. 620 nm, ca. 800 nm, ca. 1060 nm und/oder ca. 1550 nm und bei der Wellenlänge des geführten Lichtes vorzugsweise im Bereich von 1250 nm bis 1600 nm im wesentlichen transparent sind.

Re claims 2 and 26-28, Will et al discloses a method according to claim 1 in which the refractive index of the region is increased. It is inherently so because Will teaches a waveguide which inherently guides waves by regions of lower refractive index.

Re claim 3, Will et al a method according to claim 1 or 2 in which the altered region of the crystal comprises a waveguide. See figures 1-6 for clear teaching of waveguide and see claim 9 for the teaching of crystal as an alternative to silica glass (see figure 4).

Re claims 27-28, all structure following preamble is met as discussed in claim 26 above. The claim 27 recitation *a laser crystal for producing a laser beam* and the claim 28 recitation *a laser cavity* have not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Re claim 29, see paragraph [0065] and claim 9 for the suggestion of crystal that is optically transparent. Thus, the materials of YAG, Forsteryte, Vanadate, LiSAF, GSGG or Sapphire are implicit.

[0065] In überraschender Weise war die Erfindung nicht auf einzelne Gläser beschränkt sondern ließ sich im Wesentlichen bei vielen transparenten Materialien, wie beispielsweise Gläsern, Glaskeramiken und Kristallen realisieren.

Re claim 51, the method step of ***focusing*** *a pulsed laser beam at a desired position within the material and* ***moving*** *the focused beam along a path such that the focused beam alters the refractive index of the region of the material along the path* has been discussed regarding applicants claim 1 above. Re the method step of ***refocusing*** *a pulsed laser beam at a second desired position within the material and* ***moving*** *the focused beam along a second path separated from the first path such that the focused beam alters the refractive index of the region of the material along the second path*, see figure 3 which shows a two step writing method and see in particular the STEP 2.

Re claims 52-53, see figure 4 which shows *the first and second paths (10, 18) are separated by a substantially constant distance.*

Re claim 53, the recitation ***capable*** *of operating as carrier of a common supermode*, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Re claim 58 which relates to the average refractive index of the region being decreased, Will et al teaches the refractive index changes due to the laser writing of the crystal, *see e.g.* claim 3. As such the average refractive index of the region being either decreased or increased is inherent in that teaching. Further, all method steps have

been met, it would follow that the intended result of the average refractive index of the region being decreased is met.

Re claim 59 which relates to the refractive index of the region being increased in part and decreased in other parts. Will et al teaches the refractive index changes due to the laser writing of the crystal, see e.g. claim 3. As such the refractive index of the region being increased in part and decreased in other parts is inherent in that teaching.

Claim 60 is rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al (JP 06-224510). Kato et al discloses the claimed invention of a laser formed by a waveguide inscribed in a crystal of YAG lodged with Nd^{3+}. See abstract and figure 1.

Claim 62 is rejected under 35 U.S.C. 102(b) as being anticipated by Kahen (5,276,699). Kahen discloses the claimed invention of a laser formed by an effective waveguide having a cladding of depressed refraction index (see the abstact).

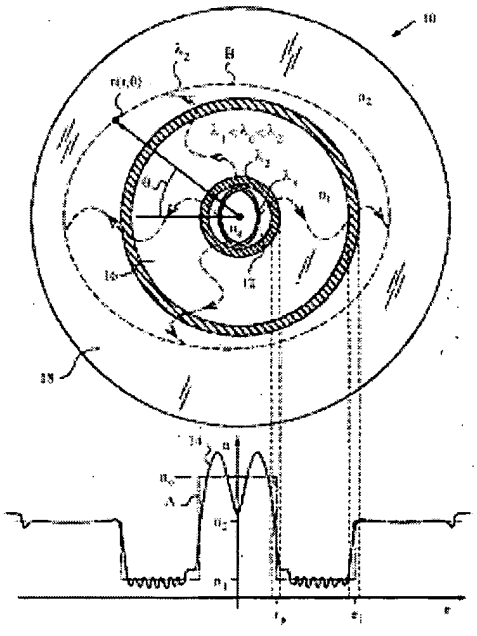
[57] **ABSTRACT**

A stabilized depressed-index cladding ridge waveguide semiconductor laser diode having a graded (index of refraction) lower cladding layer.

Re the limitation of *preferably where the core of unmodified material is surrounded, at least in part, by a number of tracks comprising material modified in a way to mainly decrease the refractive index*, it is noted that preferably makes this limitation optional and therefore the reference need not meet it. See MPEP 2111.04:

Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure.

Claim 62 is rejected under 35 U.S.C. 102(b) as being anticipated by Keaton et al (6563995). Keaton discloses the claimed invention of a laser (10, see also abstract, second from last line) formed by an effective waveguide having a cladding of depressed refraction index (16) where the core of unmodified material (12) is surrounded, at least in part, by a number of tracks comprising material modified in a way to mainly decrease the refractive index.



(57) **ABSTRACT**

An apparatus and a method for separating a light of a first wavelength λ_1 from a second wavelength λ_2, where $\lambda_1<\lambda_2$, in a waveguide such as an optical fiber is described. The apparatus includes a core surrounded by a depressed cladding, which itself is surrounded by a secondary cladding. The core cross-section, the depressed cladding cross-section, the secondary cladding cross-section, and the refractive indices of the core, the depressed cladding and the secondary cladding are selected to produce a fundamental mode cutoff wavelength λ_c such that $\lambda_1<\lambda_c<\lambda_2$, and produce a high loss at the secondary wavelength λ_2. The apparatus can be used as a filter, an amplifier, a laser, or in a nonlinear optical switch.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quyen P. Leung whose telephone number is (571) 272-8188. The examiner can normally be reached on normally M-F, 6:15 am - 2:45 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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